MANSION DEVELOPMENTS

Water Neutrality Statement

Erection of two new detached dwellings - Former Longfield House, East Street, Rusper, RH12 4RB

20th March 2025

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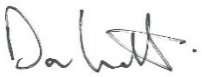
Director	Daniel Watt 
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1 Introduction

1.1 This Water Neutrality Statement (WNS) has been prepared on behalf of our clients, Mansion Developments Limited, to demonstrate how the proposed development at the Land Former Longfield House, East Street, Rusper, RH12 4RB, will achieve water neutrality.

1.2 It is proposed to construct 2 five-bedroom dwellings with associated garages.

1.3 This document has been prepared in response to Natural England's position statement concerning applications within the Sussex North Water Supply Zone (SNWSZ). The statement highlights that developments in this zone may impact the Arun Valley site and advises that these developments should not exacerbate this effect. In line with Natural England's Position Statement on Water Neutrality and the Somerset Ruling, all new, reserved matters, conditions discharge, and Section 73 planning applications within the SNWSZ must demonstrate water neutrality. This assessment ensures that the net water consumption post-development will not exceed the existing demand, thereby preventing an unsustainable burden on local water resources. The SNWSZ spans parts of Horsham District, as well as areas in the neighbouring Chichester, Arun, and Crawley Districts.

1.4 To meet the requirements for water neutrality set by Natural England (NE) and Horsham District Council (HDC), this Water Neutrality Statement (WNS) will address the following points:

- The baseline water demand for the development site;
- Any changes in water demand resulting from the proposed development;
- The water demand reduction measures to be implemented, such as installing water-efficient fixtures and fittings and rainwater harvesting;
- Whether the proposed development will achieve water neutrality; and
- Whether additional offsetting measures are needed to meet the proposed water demand.

2 Development Background

2.1 The proposed development is located at Longfield House, East Street, Rusper, RH12 4RB.

2.2 The proposal is to build two five-bedroom houses with associated garages. These houses must be offset and demonstrate water neutrality. A copy of the proposed plans is available for review in Appendix A

3 Existing Water Demand

3.1 The existing water demand in Nil.

4 Proposed Water Demand

4.1 As previously mentioned, the proposed development of the site will consist of two five-bedroom houses with garages.

4.2 Regarding the mains water demand for the dwellings, they must comply with Paragraph 2 of Schedule F1 of the Building Regulations 2010, which specifies that "the potential consumption of wholesome water by persons occupying a new dwelling must not exceed 125 litres per person per day."

4.3 The occupancy levels for the development have been derived from local census data, as recommended by Horsham District Council (HDC) in their water neutrality methodology guidance. A summary of this data is provided in Table 1 below.

1-Bedroom	2-Bedroom	3-Bedroom	4-Bedroom	5-Bedroom
1.32	1.88	2.47	2.86	3.09

Table 1 - Average occupancy levels per dwelling size in the district

4.4 Using the data provided by Horsham District Council, the estimated population per dwelling is **3.09**.

4.5 To reduce the demand on mains water, it is proposed that the dwellings will achieve a water efficiency of no more than 110 litres per person per day, in line with the optional water efficiency target set out in Part G of the Building Regulations. This will be accomplished through the installation of water-efficient fixtures and fittings.

4.6 A water calculation in compliance with Building Regulations Part G has been conducted and confirms that the proposed dwellings will achieve a water consumption of 109.63 litres per person per day, including an allowance of 5 litres per person per day for external water usage. The calculation is summarised in **Table 2** on the following page. A copy of the full breakdown of this calculation can be found in **Appendix B**.

Installation Type	Use Factor	Litres/person/day
WC (Part Flush)	2.96	8.88
WC (Full Flush)	1.46	6.57
Taps (Excluding Kitchen & Utility)	1.58	9.48
Shower (where bath also present)	4.37	39.33
Bath (where shower also present)	0.11	16.50
Kitchen/Utility Room Taps	0.44	12.56
Washing Machine	2.1	17.16
Dishwasher	3.6	4.5
Total	-	114.98
Normalisation Factor	0.91	-
Total	-	104.63
External use	-	5.00
Total	-	**109.63**

Table 2

4.7 Using the Part G water consumption figure of 109.63 litres per person per day and the census-based population of 3.09, it is estimated that the mains water demand for the proposed development will be 339.9 litres per day per dwelling, resulting in a total of 679.80 litres per day for the development.

4.8 **109.63 x 3.09 = 339.9 (per dwelling). 339.9 x 2 = 679.80 litres per day total usage.**

4.9 To achieve water neutrality, additional water reduction measures are necessary.

5 Mitigation 1 - Rainwater Harvesting Systems

5.1 To offset the increase in water demand, it is proposed to implement rainwater harvesting onsite within the development.

5.2 The water collected by the rainwater harvesting system will be used for flushing toilets, washing machines and external taps. All other water requirements will be supplied by mains water, as these uses require 'wholesome water' and cannot rely on recycled rainwater.

5.3 **Table 3** outlines the water uses, as specified in the Part G calculation, and illustrates the division between mains water usage and water supplied by the rainwater harvesting system.

Installation Type	Total Water Usage (l/p/day)	Mains Water Usage (l/p/day)	RWH System Usage (l/p/day)
WC (Part Flush)	8.88	-	8.88
WC (Full Flush)	6.57	-	6.57
Taps (Excluding Kitchen & Utility)	9.48	9.48	-
Shower (where bath also present)	39.33	39.33	-
Bath (where shower also present)	16.50	16.50	-
Kitchen/Utility Room Taps	12.56	12.56	-
Washing Machine	17.16	-	17.16
Dishwasher	4.5	4.50	-
Total	114.98	82.37	32.61
Normalisation Factor	0.91	0.91	0.91
Total	104.63	74.96	29.67
External use	5.00	0.00	5.00
Total	**109.63**	**74.96**	**34.67**

Table 3

5.4 **Table 3** confirms that the rainwater harvesting system can supply 34.67 litres per person per day, which amounts to 107.13 litres per day based on the previously established population of 3.09 persons. This results in total savings of 214.26 litres per day for the development site.

5.5 **34.67 x 3.09 = 107.13 (per dwelling). 107.13 x 2 = 214.26 litres saved per day, total usage.**

5.5 The rainwater harvesting tank for the proposed dwellings has been designed based on the calculations outlined in BS EN 16941-1:2018. It will have sufficient capacity to store 9.6% of the Annual Water Demand, ensuring at least 35 days of storage during drought periods, as required by HDC.

5.6 The calculations verify that the yields are adequate to meet the requirements for each dwelling type. The annual rainfall data from the nearest MET Office climate station, Charlwood Station, was used in the calculations. A summary of the calculation is provided in Table 4 below, with the full details available in Appendix C.

Dwelling	Population	Roof Area (M2)	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Minium Tanks Size (litres)
Plot 1	3.09	168	10,828.99	3,746	4,000
Plot 4	3.09	168	10,828.99	3,746	4,000

Table 4 – Rainwater Tank Size Calculations

5.7 Following the calculations in Table 4, it is recommended a tank with a minimum capacity of 4,000 litres is installed in each dwelling.

5.8 After the installation of rainwater harvesting systems, the mains water demand for each dwelling will decrease to 79.54 litres per day. This represents a net reduction of 214.26 litres per day for both dwellings from the baseline water usage of 679.80 litres per day. This leaves a net water demand of 465.54 litres per day. The calculation can be seen below. At this stage, the proposed development cannot be considered water neutral.

5.9 **679.80 – 214.26 = 465.54 l/p/d.**

6 Mitigation 2 – Extant Permission

6.1 There is currently an extant planning permission under DC/21/2359 for a 5-bedroom dwelling (plot 1).

6.2 The water usage for this permission uses the approved 125 litres per day per person baseline when it was approved. This means that the approved dwelling 'plot 1' currently has a water allowance of 386.25 litres per day. The calculation can be seen below.

6.3 **125 x 3.09 = 386.25**

6.4 To apply mitigation for this project, the permission **in relation to plot 1 only** will be "surrendered," meaning it will no longer be valid for construction. This surrender allows the saved water credits from the previous permission to be applied to the new development

6.5 By using this mitigation the water demand reduces from 465.54 to 79.29 litres per day.

6.6 **465.54 – 386.25 = 79.29 litres per day**

6.7 At this stage, the proposed development cannot be considered water neutral. Further mitigation measures are required.

7 Mitigation 3 - Offsetting

7.1 Despite the implementation of onsite water-saving measures & mitigation, the water usage still prevents the site from becoming water neutral. This leaves only one remaining option: offsetting the water usage through saving measures at other locations.

7.2 Mansion Developments Limited has secured water-saving measures at a local office building in Horsham, West Point. These measures will generate credits that can be applied to this development, helping to reduce the mains water supply.

7.3 The measures undertaken resulting in taps being changed in all the bathrooms from the 1st floor upwards to water efficient and low flow taps. These measures left a net water saving of 771.60l/p/d. The details of all the water saving measures can be found in Appendix D.

7.4 It is noted that some of these savings have been used on another development site. This has left the available water saving credits at 166 l/p/d.

7.5 It is proposed that 166 litres per day of water saving measures will be used for this development from West Point, Springfield Road, Horsham, West Sussex, RH12 2PD.

7.6 Following the utilization of the West Point water credits, the water demand for the site will be reduced to -86.71 litres per day. This results in a net reduction of 166 litres per day from the baseline water usage of 79.29 litres per day. With this reduction, the proposed development can now be regarded as water neutral and in fact saves an additional 86.71 litres per day.

7.9 **79.29 – 166 = -86.71 litres per day**

8 Summary and Conclusions

8.1 This Technical Note outlines the water usage strategy for the proposed development at Longfield House, East Street, Rusper, RH12 4RB.

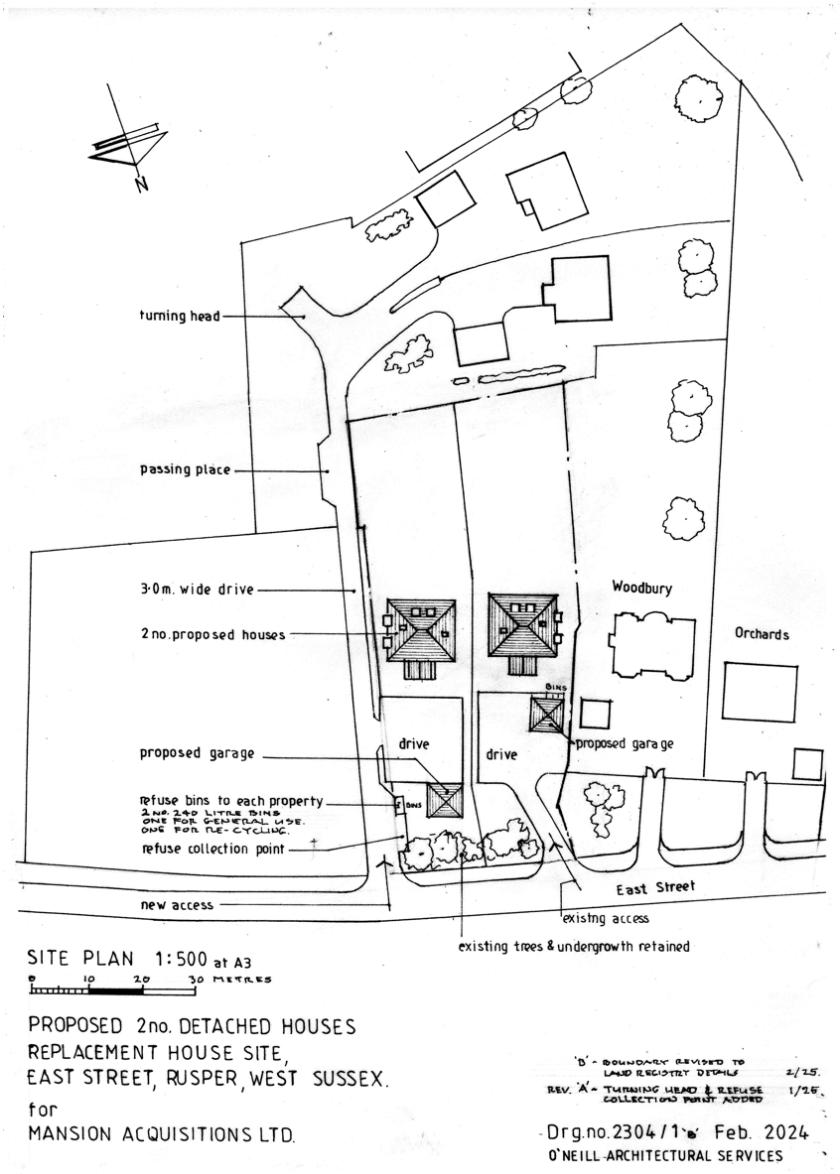
8.2 The proposal involves the construction of two 5-bedroom houses with garages, featuring water-efficient fixtures and fittings, as well as rainwater harvesting systems to reduce the water demand of the development. Further mitigation has been used with offsetting measures implemented at the West Point office building in Horsham.

8.3 The proposed development results in a net reduction in water demand within the SNWSZ and can achieve water neutrality.

8.4 This strategy will reduce the impact of the new development on the SNWSZ. The WNS confirms that the proposal will achieve water neutrality upon completion, thereby meeting NE's requirements

APPENDIX A – Site Plans





APPENDIX B – Proposed Water Usage Calculations Part G

Table 1: The water calculator for new dwellings					
Installation type	Unit of measure	Capacity/ flow rate	Use factor	Fixed use (litres/ person/ day)	Litres/ person/day = [(1) x (2)]
WC (single flush)	Flush volume (litres)	**0**	4.42	0	0
WC (dual flush)	Full flush volume (litres)	**4.5**	1.46	0	6.57
	Part flush volume (litres)	**3**	2.96	0	8.88
WCs (multiple fittings)	Average effective flushing volume	**0**	4.42	0	0
Taps (excluding kitchen/utility room taps)	Flow rate (litres/minute)	**5**	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow (litres)	**150**	0.11	0	16.5
Shower (where bath also present)	Flow rate (litres/minute)	**9**	4.37	0	39.33
Bath only	Capacity to overflow (litres)	**0**	0.5	0	0
Shower only	Flow rate (litres/minute)	**0**	5.6	0	0
Kitchen/utility room sink taps	Flow rate (litres/minute)	**5**	0.44	10.36	12.56
Washing machine	Litres/kg dry load	**8.17**	2.1	0	17.16
Dishwasher	Litres/place setting	**1.25**	3.6	0	4.5
Waste disposal unit	Litres/use	**0**	3.08	0	0
Water softener	Litres/person/day	**0**	1	0	0
		Total calculated use (litres/person/day) = (Sum column 4)			**114.98**

Table 1: The water calculator for new dwellings Cont..					
Installation type	Unit of measure	Capacity/ flow rate	Use factor	Fixed use (litres/ person/ day)	Litres/ person/day = [(1) x (2)]
		Contribution from greywater (litres/person/day) from Table 4.6			0
		Contribution from rainwater (litres/person/day) from Table 5.5			0.00
		Normalisation factor			0.91
		Total water consumption (Code for Sustainable Homes)			**104.63**
		External water use			5
		Total Water Consumption (Building Regulations Part 17.K)			**109.6**

APPENDIX C – Rainwater Harvesting System, Rainfall Data & Calculations

Rainwater Harvesting System (BS EN 16941-1:2018 – Intermediate Approach)

A	168m2	Collection Area
E	0.9	Yield Coefficient
AAR	833.69	Annual Rainfall
H	0.9	Hydraulic Filter Efficiency
Pd	34.69	Daily Requirement Per Person

Dwelling	No. Beds	Population	Roof Area (M2)	9.6% Annual Rainwater Yield (litres)	9.6% Annual Water Demand (litres)	Minium Tanks Size (litres)
Plot 1	5	3.09	168	10,828.99	3,749	5,000
Plot 4	5	3.09	168	10,828.99	3,749	5,000

Annual Rainfall Date – MET Office Climate Averages

Average tables | Average graphs | Location comparison | Average maps

Climate period: 1991-2020

Station: Charlwood

Month	Maximum temperature (°C)	Minimum temperature (°C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)	Days of rainfall ≥1 mm (days)	Monthly mean wind speed at 10 m (knots)
January	7.83	1.52	10.89	53.42	90.34	13.10	6.56
February	8.49	1.44	10.47	75.42	64.46	10.86	6.56
March	11.20	2.79	7.35	119.36	53.65	9.44	6.60
April	14.50	4.24	3.87	171.48	52.49	9.73	5.80
May	17.74	7.11	0.60	206.31	54.83	8.90	5.44
June	20.80	9.92	0.03	209.70	50.67	8.79	5.12
July	23.14	11.99	0.00	215.95	54.73	8.45	4.82
August	22.70	11.86	0.00	199.09	60.42	9.29	4.64
September	19.55	9.51	0.07	156.01	64.71	9.15	4.68
October	15.35	7.10	1.66	110.62	94.33	12.51	5.18
November	11.11	3.91	6.09	65.21	97.11	13.17	5.20
December	8.25	1.74	11.89	45.87	95.95	12.82	5.94
Annual	15.09	6.12	52.92	1628.44	833.69	126.21	5.54

Mains backup and rainwater management

Rain Director mains backup and computer-controlled rainwater management system with smart header-tank

The Rain Director® ensures a constant head of clear rainwater under gravity for washing machines, toilets, the garden and other uses. A header tank in the home is controlled by electronic level sensors, valves and a control panel (fitted on a wall on the ground floor). The advantages over rainwater pumping systems like the Rain Manager are:



a) The header tank only refills once it's completely empty so wear on the pump and electricity usage are both reduced (by a factor of 8).

b) Provides a constant flow of rainwater under gravity at any time, including during power cuts.

c) Mains water backup is automated by 12v electric level sensors.



d) Rain Director®'s dashboard indicates present mode and allows special modes to be selected.

e) Rain Director®'s auto-flush function detects when the occupant is away from home (for example, for holidays) and puts mains into the header instead of rainwater: no stained toilet bowls.

f) Rain Director®'s set-up mode lets the control unit memorise the header tank size and flow rate of the mains and rain water inflow. This enables the time-out periods and operating water levels to be set.

g) Rain Director® header tank has a built-in air gap as required by UK building regs.

h) Price is similar to, or lower than, that of rain managers and other mini header-tank systems.

i) Pump remains in the underground rain water tank so, there is no pump noise in the house.

All components have been designed to comply with WRAS (Water Regulations Advisory Scheme) and UK Building Regulations.

Rainwater Harvesting Limited, Unit A Harrier Park, Southgate way, Orton Southgate, Peterborough, PE2 6YQ
Tel : 01733 405111 Fax : 01733 230996 Email : info@rainwaterharvesting.co.uk
www.rainwaterharvesting.co.uk

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The **Series 4** water pump from HydroForce Pumps Ltd.

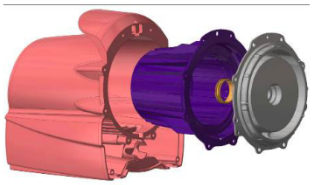
HydroForce



The Series 4 pump has been engineered by HydroForce Pumps Ltd in Peterborough to respond to the demand for the highest quality pump for use underwater in rainwater harvesting tanks. Using the most rugged components it has been exhaustively tested for trouble-free running. The pump features a self-controlling pressure switch and dry run protection. It is suitable for total immersion in rainwater or it can be externally connected to the tank above ground. The Series 4 will deliver up to 3.5 bar (household pressure is around 2.5-4.0 bar). If connected to a hose or tap, the pump will automatically start to pump water when the tap or hose is turned on. The pump delivers over 2500 litres per hour using a 1" connector and runs at 230v AC delivered by a 5 metre cable.

Specifications

- Submersible: for underwater use in a rainwater tank, or can be used above ground
- Extended two year guarantee
- Nominal pump pressure at outlet 3.5 bar
- Max head 35 metres
- Pressure-sensitive (demand) pump: turns itself off until there is demand for water
- Dry-run Protection: when no water is detected for 8 seconds, the pump is turned off in order to protect the motor and pump from burning out. Automatic reset after a period of 30 minutes.
- Radial flow centrifugal roto-dynamic pump with no reciprocating parts
- **New:** Alloy bulkhead, pressure release gap and twin chamber design prevents ingress of water to motor, electrical components and to bearing oil.
- **New:** Double bearing seal prevents egress of bearing oil.
- **New:** Alloy bulkhead dissipates motor heat to water in the second chamber.
- **New:** Logic processors in Series 4 printed circuit board prevent other pump anomalies and permit factory programming of reset timings.



- **New:** Each pump is tested before leaving our factory. Factory measurements are on record for each individual pump. No user-serviceable parts
- Electricity consumption 800 watts at 230 Volts AC 50 Hz (requires 10 or 13 amp fuse and RCD mains socket). Connection cable 10m H07RN-F.
- Dimensions L 565 W 185 H 260 mm, weight 12 kg
- Max suction 8 metres deep, preferable operating regime 4 metres deep
- Inlet port to the non-removable cartridge filter 1 inch (25mm) female BSP
- Outlet port 1 inch (25mm) female BSP provided with push-fit connector for 1 inch (25mm) MDPE pipe.
- Supplied with an inline filter, 1" intake strainer and 1" outlet connection.

Italian styling
British engineering
British manufacture

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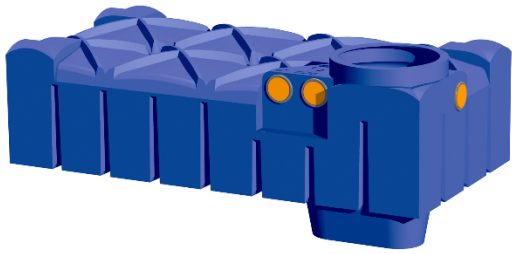
11

F-Line Flat Tank shallow dig underground tank



Why buy this tank?

- The F-Line is a high quality, rotationally moulded, one piece rainwater tank that can be installed without the need for concrete, thereby minimising installation costs and supported by our long term 25 year tank guarantee.
- Minimal installation depth
- Easy and quick to install
- Small excavation pit and little earth excavation preserves your garden
- Ideal for installation in new or existing properties
- Can be installed in ground water up to tank shoulder
- Easy to install

The F-line flat tank can be installed into much higher water tables than a standard round tank. If you don't know what your water table will be like in the winter, you're safer to install a flat tank. The F-Line tanks are flat and the installation depth is up to 60% less than other rainwater tanks. The excavation can be up to 70% less, meaning little earth excavation, easy handling and less cost for you! The small excavation pit is easily filled in and your garden will look just like it did before.

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Rainwater Harvesting maintenance schedule.

Filter: *Warranty 2 years. Expected service life 100 years.*

Self cleaning filter with 1000 micron screen.
Every 6 months*. Visually check the filter for larger blockages.



1. Release child locks on the lid. (13mm bolt).
2. Inspect filter for visible large blockage.
   If large or non moving debris is found refer to stage 3. Is none is found refer to stage 6.

   NB: Small debris will we periodically self cleaned during storms. Leaves, moss and other smaller debris will self clean and do not require removing unless obvious they are causing a blockage.
3. (If a blockage has been found) Remove filter lid.
4. Remove debris, wash filter head under a tap.
5. Replace filter head.
6. Replace lid, ensure 13mm child safe locks are tight.

6.2 Treatment

A filter is the first step to treating rainwater. This will prevent solid debris and leaves from entering the storage tank. This is the only line of treatment required if the RWH system is to be used for toilet flushing and garden watering.

Whist no further treatment is actually required, there are a number of 'good practice' measures that can be taken to maintain the quality of the water:

- overflow siphons which allow floating material to be removed;
- rodent barrier - a device on the holding tank overflow pipe to prevent rodents entering the holding tank; and
- a floating extraction with additional filter that allows rainwater to be taken from just below the surface where the water is cleanest.

Bird and animal faeces and leaf litter on roofs or guttering can pose a health risk if they are washed into the RWH system. Gutters should be cleared regularly.

7.1 Water quality

There are currently no regulatory water quality standards for rainwater use in England and Wales. Harvested rainwater should not be used as drinking water unless treated to a potable quality. There are strict regulations concerning the quality of water for drinking. Please refer to the Drinking Water Inspectorate[12] for further information. Guidance and further information on rainwater harvesting is available in BSI 8515.

It's not necessary to test harvested rainwater frequently because it is used for purposes that do not present significant risk. However, water quality observations should be carried out during maintenance visits to identify any problems early.

7.2 Contamination

Simply filtering harvested rainwater is generally good enough when rainwater is collected from a roof, but there is always a risk of contamination.

Where rainwater is collected from a driveway the risk of contamination from oil or faecal material is higher. Oil traps can be installed but don't remove all of the oil. As a result, some suppliers advise against using driveways to collect water, although a suitable permeable pavement with appropriate substrate below can provide a reasonable level of treatment.

There are some types of roof cover that are less suitable for rainwater collection because they are more likely to affect the water quality:

- asbestos-cement roofs can cause filters to block, reducing the amount of water collected and potentially posing a health risk;
- metal roofs (except stainless steel) can release small amounts of leachates, which can stain water fixtures, for example, copper roofs may colour water green;
- bitumen felt or coated roofs can lead to discolouration and odour problems;

7.3 Maintenance

It is essential that humans don't enter tanks unless absolutely necessary. This should only be attempted by a trained professional who has the appropriate equipment and training to work in confined spaces. In addition to the manufacturer's maintenance guidance, we recommend that you should:

- clean filters approximately three times a year, depending on tree cover over the collection area;
- keep gutters free of debris to prevent blocking the system;
- visually inspect the tank at least once a year;
- check the mains water top-up once a year.

BS 8515 provides useful recommendations on maintenance schedules.

Maintenance and repair of communal RWH systems is an ambiguous area and has been considered by the Construction Industry Research & Information Association (CIRIA) [17]. *Rainwater and Greywater Use in Buildings: Project Results From The Buildings That Save Water Project; Best Practice Guidance (C539), CIRIA (2001)*, provides advice on the use and development of model operation and maintenance arrangements for both rainwater and greywater systems. It also includes simple guidance on how to incorporate these systems in developments.

The full Environment Agency document can be found at https://webarchive.nationalarchives.gov.uk/ukgwa/20140328084622/http:/cdn.environment-agency.gov.uk/geho1110bten-e-e.pdf

APPENDIX D – Offsetting Measures at West Point

The occupancy of the offices has been based on the OFFPAT figure of 12m²/person. Retrofit measures will be carried out on four floors, with a total occupancy of 60 people. (Note, occupancy figures have been rounded down to the nearest whole number). The table below demonstrates how the occupancy for each floor has been calculated. The appendix to this report provides the office particulars and confirms the area of the office space on each floor is 190.17m², meaning a total occupancy of 15 people per floor.

Floor	Area (sqm)	People/sqm	Occupancy (people)
1st Floor	190.17	12	15
2nd Floor	190.17	12	15
3rd Floor	190.17	12	15
4th Floor	190.17	12	15

A calculation for the water saving that could be achieved by installing retrofit measures can be viewed in figure 6 below. Water consumption figures have been calculated using the BREEAM WAT 01 standard calculator (as appended to this report).

The resultant water savings will effectively offset the 606 litres/day consumption of the site post-development, meaning it will be *net water negative* (I.e. saving water overall).

The table below demonstrates that the retrofit measures would save 771.6 Litres of water a day, meaning a net overall water consumption of -166 Litres.

BREEAM water consumption data

	Water consumption per occupant (L/person/day)	Occupants	Total water consumption (Litres)	Notes
Existing building	17.83	60	1069.8	Refer to BREEAM water calculator – existing scenario
Proposed – after water saving measures	4.97	60	298.2	Refer to BREEAM water calculator – proposed scenario

Water saved per day (Litres)	771.6

Site consumption (L/day)	Net Water consumption (L/day)	Cost (£)
606	-166	Refer to Gillson Moore Quote

Offset scheme summary

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Energy & Consulting Engineers